UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,847	11/25/2003	Satchidanand Mishra	A1145I	6934

25453 7590 05/19/2006

PATENT DOCUMENTATION CENTER
XEROX CORPORATION
100 CLINTON AVE., SOUTH, XEROX SQUARE, 20TH FLOOR
ROCHESTER, NY 14644

EXAMINER	
THOMAS, LUCY M	

ART UNIT	PAPER NUMBER
2836	

DATE MAILED: 05/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/721,847	MISHRA ET AL.	
	Examiner	Art Unit	
	Lucy Thomas	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-23* is/are rejected.

7)☒ Claim(s) *4* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

1. The Double Patenting rejection of Claims 1-6, 8-12, 18-23 over Claims 1-27 of US Patent No. 6,909,867 has been withdrawn due to the submission of terminal disclaimer filed on 3/07/2006.

Drawings

2. The replacement drawings filed on 2/21/2006 are in acceptable form.

Claim Objections

3. Claims 1, 7, 12, and 20 are objected to because of the following informalities: Claim 1 is objected to being indefinite as the claim states that "the elements further being arranged in a profile that reduces shielding effects" however, there is no support in the claim for providing such a structure. Although the specification mentions reducing shielding effects, it is unclear what arrangements would provide for the reduction of shielding effects.

Recitation of "pins at edges of the array being more closely packed than the pins near the center of the array" in line 2-3, Claim 7 is not supported by the disclosure.

Recitation of "the apparatus" in line 1, Claim 12 should be corrected to "the device" as there is insufficient antecedent basis for this limitation in the claim.

Regarding claim 20, the phrase "to project less than elements" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Mishra et al. (US 5,300,986). Mishra et al. discloses a corona producing device (Figures 3, 4) comprising: a plurality of corona producing elements 114 arranged in at least one group; the elements being directed at and spaced from a charge retentive surface 20; the elements further being arranged a profile that reduces shielding effects; a power source (see Figure 3) connected to the at least one plurality of corona producing elements; and supports 116 to which the at least one plurality of corona producing elements are attached (Column 7, lines 46-58). This configuration provides a reduction of shielding effects (as opposed to having no corona producing element). Therefore, it is believed that the claim limitations are fully met.

6. Claims 13-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Walsh et al. (The Negative Corona Distribution for a Long Pin-to Plane Geometry). Regarding Claim 13, Walsh et al. discloses a corona producing element profile determination method comprising determining an electrical potential in space between a charging device and a surface, determining a spatial variation of an electric field of the electric potential, determining the electric potential in space comprising determining an electrical

potential at a plurality of points throughout a region between a charge-producing array of the corona producing elements and a photoreceptor of a marking machine to adjust a profile of the corona producing elements (Page 104-108, Figures 10, 11). The reference teaches the method of determining an electric potential in space, which is a point anywhere in space, including between a charging device and a surface, for functions including, to adjust a profile of the corona producing elements, and therefore meets the claim limitations.

Regarding Claims 14 and 15, Walsh discloses the method of profile determination including solving the Laplace equation as recited in Claim 14 and electric field components as recited in Claim 15 (Page 104, Column 2), except that the calculations are shown in spherical coordinate system, instead of Cartesian coordinate system as recited in Claims 14 and 15. Claim 16 recites that the profile is determined by iterative adjustment of the elements so that the electric field at substantially all points is substantially equal. Claim 17 expresses the magnitude of the electric field expressed in component form in Claim 15. However, the selection of coordinate system is typically based on the symmetry for reducing the number of steps involved in the calculation of quantities of interest to simplify calculations. Regarding the method Claim 16, one would necessarily perform the steps to obtain a substantially uniform electric field to produce high quality images.

Claim 18 basically recites the steps of method Claims 13 and 16, except that Claim 18 recites as steps to charge a charge retentive surface, whereas Claim 13 and 16 recites as steps for element profile determination.

Claims 18-23 discloses the Laplace equation and electric field components and its magnitude as recited in Claims 13-17 except that Claim 13-17 recites the steps as part of charge profile determination whereas Claims 18-23 recites the steps as part of charging a charge retentive surface. Therefore, please see the rejection for Claims 13-17 above.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mishra et al. (US 5,300,986) in view of Crosky et al. (US 2,890,388). Regarding Claims 2-3, Mishra fails to disclose a corona producing device, wherein the elements include an array of pins projecting toward the charge retentive surface, pins at edges of the array projecting less than pins toward a center of the array as recited in Claim 2, and an array of pins comprises a first line of pins projecting further toward the charge retentive surface in accordance with their proximity to a center of the first line of pins as recited in Claim 3. Crosky et al. discloses a device to atomize coating material, wherein the elements include an array of pins 80 projecting toward the charge retentive surface, pins at edges of the array projecting less than pins toward a center of the array, and the array of pins comprises a first line of pins projecting further toward the charge retentive

surface in accordance with their proximity to a center of the first line of pins (Figure 3, Column 1, lines 15-33, Column 3, lines 12-19). It would have been obvious to those skilled in the art to modify Mishra's device to include an array of pins or array of pins with a first line of pins as taught by Crosky, because shorter pins at the edge of the array eliminate the non uniform shielding effect at the edges and thus provide a uniform charge density and potential profile.

9. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mishra et al. (US 5,300,986) in view of Crosky et al. (US 2,890,388) and Darty (US 6,899,854). Regarding Claim 5 and 6, neither Mishra or Crosky disclose an array of pins further comprises at least a second substantially parallel line of pins whose pins project further toward the charge retentive surface in accordance with their proximity to edges of the second substantially parallel line of pins (Claim 5), wherein the degree of projection also varies with the line of pins in which the lines are held. Darty discloses arrays of multiple electrodes for the projection of ions from a corona chamber to form the charge pattern (Column 1, lines 12-28). It would have been obvious to modify the device of Mishra and Crosky to include a second substantially parallel line of pins as taught by Darty to facilitate more flexibility for efficient and uniform charge transfer to produce high quality images.

10. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mishra et al. (US 5,300,986) in view of Crosky et al. (US 2,890,388) and Yonekawa et al. (US 6,208,499). Claims 8 and 9 recites elements of Claim 2 and 3 limiting corona producing elements as an array of teeth, instead of pins. Neither Mishra or Crosky

disclose an array of teeth. Yonekawa discloses a corona discharge device with an array of teeth. It would have been obvious to those skilled in the art at the time the invention was made to modify the device of Mishra and Crosky with an array of teeth as taught by Yonekawa to increase the sharpness of the electrode to reduce the amount of ozone generated and thus to increase the environmental protection. Yonekawa further discloses that a first line of teeth includes teeth of a substantial sawtooth configuration (Figure 1, Column 2, lines 44-49) as recited in Claim 10, which comprises a stamped sheet of metal (Column 3, lines 56-67) as recited in Claim 11. It would have been obvious to those skilled in the art at the time the invention was made to modify the device of Mishra and Crosky with a first line of teeth includes teeth of a substantial sawtooth configuration which comprises stamped sheet of metal as taught by Yonekawa to suppress the generation of ozone and to increase the durability.

Allowable Subject Matter

11. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: Claim 4 discloses the corona producing device, further comprising bores into which the pins are inserted and in which the pins are held and the depth of pin insertion can be varied to adjust the degree to which the pins project toward the charge retentive surface. This limitation, in combination with the other recited elements, is not disclosed by the Prior Art of record.

Response to Arguments

13. Applicant's arguments filed on 2/21/2006 have been fully considered.

Applicant states that Mishra fails to disclose or suggest a corona producing device that includes a plurality of corona producing elements arranged in a profile that reduces shielding effect. Mishra discloses a corona producing device (Figures 3, 4) comprising: a plurality of corona producing elements 114 arranged in at least one group; the elements being directed at and spaced from a charge retentive surface 20; the elements further being arranged a profile that reduces shielding effects; a power source (see Figure 3) connected to the at least one plurality of corona producing elements; and supports 116 to which the at least one plurality of corona producing elements are attached (Column 7, lines 46-58). Therefore, the reference teaches every element of Claim 1.

Applicant states that Walsh fails to disclose or suggest using he mathematical equations (Laplace equations) in order to reduce the shielding effect between various corona producing elements. Laplace equations are set of general equations used for electric field calculations at any point in space. Walsh discloses a corona producing element profile determination method comprising determining an electrical potential in space between a charging device and a surface, determining a spatial variation of an electric field of the electric potential, determining the electric potential in space comprising determining an electrical potential at a plurality of points throughout a region between a charge-producing array of the corona producing elements and a photoreceptor of a marking machine to adjust a profile of the corona producing

elements (Page 104-108, Figures 10, 11). Walsh teaches the method, using the mathematical equations, of determining an electric potential in space, which is a point anywhere in space, including between a charging device and a surface, for functions including, to adjust a profile of the corona producing elements, to reduce the shielding effect between various corona producing elements and therefore meets the claim limitations of independent claims 13 and 18.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lucy Thomas whose telephone number is 571-272-6002. The examiner can normally be reached on Monday - Friday 8:00 AM - 4:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2058. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LT
May 05, 2005

PHUONG T. VU
PRIMARY EXAMINER